

A New Genus of Naucoridae (Hemiptera) from the Philippines, with Comments on Zoogeography

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Abstract.—The genus *Sagocoris* Montandon is endemic to New Guinea with the supposed exception of a single species, *S. usingeri*, described by La Rivers from Luzon. A recent examination of the type of this species reveals that it is not congeneric with *S. biroi*, the type-species of *Sagocoris*. A new genus, *Philippinocoris*, is thus proposed to hold the Philippine taxon, and notes are given on the relationships of the Philippine naucorid fauna to that of New Guinea and Asia.

We thank Dr. R. T. Schuh of the American Museum of Natural History (AMNH) for the loan of the types of *S. usingeri*, and Dr. Wayne Gagne for the loan of material held in the Bishop Museum, Honolulu (BPBM). All additional material is held in the J. T. Polhemus collection, Englewood, Colorado (JTPC). Measurements are given in millimeters. This research was supported in part by a grant from the National Geographic Society, Washington, D.C.

Philippinocoris n. gen.

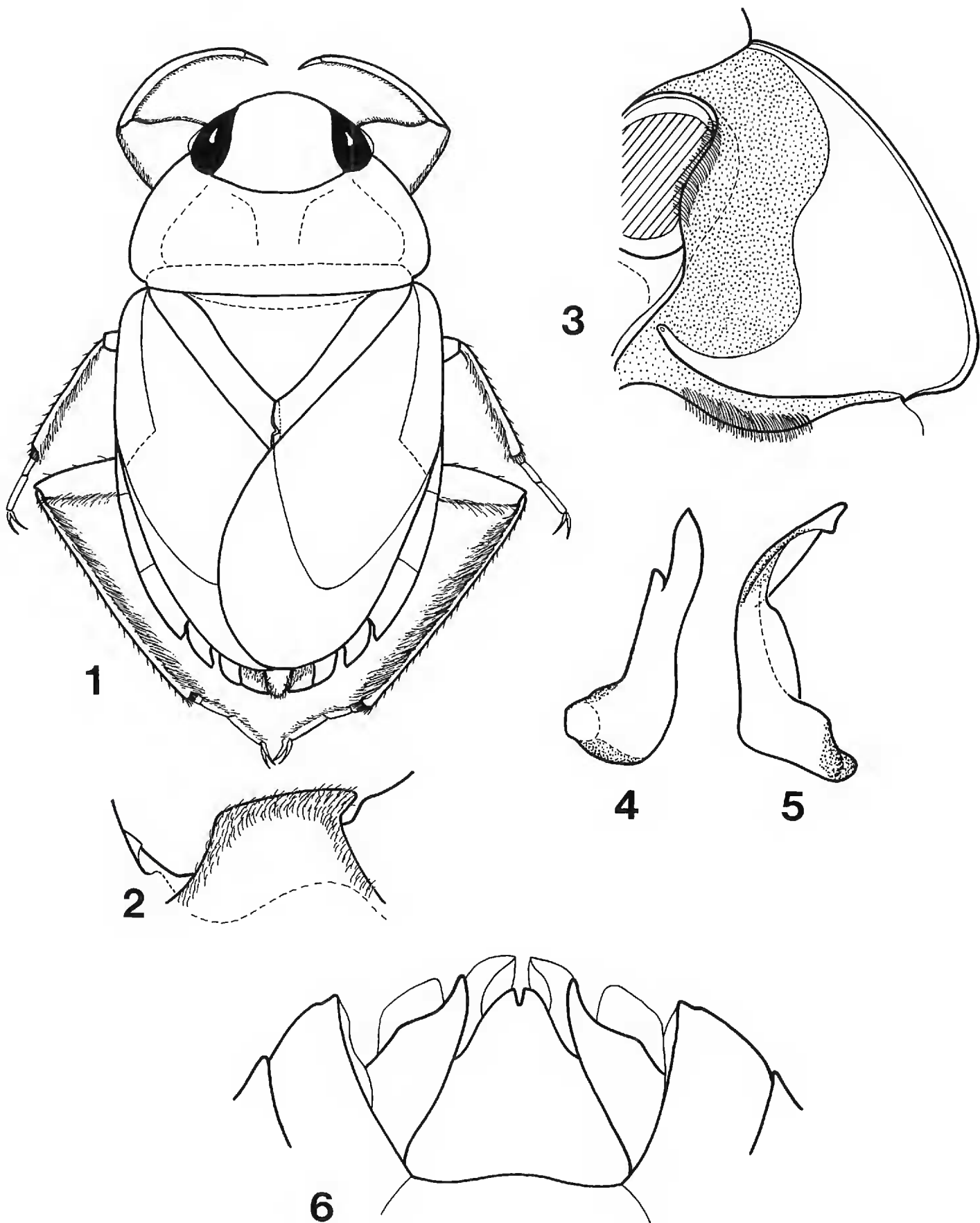
Description.—Form oblong with sides subparallel, widest across abdomen (Fig. 1).

Head broad, produced ahead of eyes for over .25 the length of an eye, anteclypeal margin gently rounded, vertex produced for short distance behind eyes, posterior margin gently curving; eyes twice as long as wide, with small lateral flange; labrum large, well developed, arising behind anterior margin of anteclypeus; maxillary plates vertically oriented, tips pointed, exceeding base of labrum; rostrum arising well behind anterior margins of eyes when viewed laterally, occupying cavity formed by maxillary plates and carinate margins of tectiform gula; antennae with segment I short, segment II enlarged, segments III and IV slender, covered with long setae.

Pronotum evenly domed, not sulcate medially behind head, lateral margins broadly rounded, posterolateral angles obtuse. Scutellum shallowly and transversely sulcate basally, with several backwardly angling shallow sulci apically to either side of smooth medial surface. Hemelytra complete, attaining base of genital segment, surface shining, finely rugose, bearing granular white microstructure; embolium, clavus and claval vein well defined, embolar margin not expanded, nearly straight, lacking setae.

Abdomen with connexivum evenly rounded, posterolateral angles not prominent, posterior margin of tergite V in males weakly sinuate, posterolateral angles of tergite VI in females angled sharply downward.

Ventral surface with prosternum carinate medially, exposed for entire length, anteromedial portion angled forward over base of gula (Fig. 2); propleural plates not touching medially, widely separated by exposed prosternum, posterior margins and



Figures 1–6. *Philippinocoris usingeri* (La Rivers). 1. Male, dorsal habitus. 2. Prosternal keel, lateral view. 3. Prothorax, right side as viewed ventrally. 4. Male left paramere. 5. Male right paramere. 6. Female subgenital plate (setiferation omitted).

flanges bordering fore coxal cavities fringed with gold setae (Fig. 3), inner portions adjoining fore coxal cavities darkened, pruinose; mesosternal plate reflexed anteromedially, tumescent posteromedially, tumescence bearing long gold setae; metasternal plate glabrous, cruciform, with sharp longitudinal carina medially; abdominal venter thickly clothed with gold hydrofuge pile, paratergites bearing paired elongate glabrous depressions adjacent to spiracles.

Legs with fore tarsus single segmented, bearing single minute claw, middle and hind tibia bearing numerous short stout spines along anterior margins, long fine swimming hairs present on middle and hind femora, tibiae and tarsi, parempodia setiform.

Male genitalia with asymmetrical parameres of roughly equal size (Figs. 4, 5); vesica slender, tapering, asymmetrical, sclerotized, coming to acute point apically.

DISCUSSION

Philippinocoris n. gen. is most closely related to *Stalocoris* and *Asthenocoris*, all three genera being endemic to the Philippines. These genera share a common plan in the male genitalia, possessing a slender, tapering, asymmetrical sclerotized vesica and distinctively shaped left parameres of much the same form as those found in the genus *Naucoris*. In the Papuan *Sagocoris*, by contrast, the vesica, though still asymmetrical, bears a broadly expanded, partially membranous lobe apically and the left paramere is reduced to a small truncate stub, character states also found in the closely related Papuan genus *Aptinocoris*. Additional characters present in *Philippinocoris* and absent in *Sagocoris* are the large dark pruinose area on the inner portion of the propleura adjoining the fore coxae, the fringes of gold setae along the posterior margin of the propleura and on the flange adjoining the fore coxal cavity, the mesosternal tumescence covered with long gold setae and the strongly carinate cruciform metasternal plate. In *Sagocoris* the rostrum arises ahead of the anterior margin of the eye when viewed laterally, while in *Philippinocoris* the rostrum is set farther back, arising behind the anterior eye margin. Abdominal asymmetry is present in both sexes of *Sagocoris*, the males having a distinct offset notch in the posterior margin of tergite V and the females of most species having the posterolateral angles of tergites VI and VII prolonged on the left side when viewed from above. In *Philippinocoris* the posterior margin of tergite V in males is only weakly sinuate, lacking a deep notch, and the female tergites are symmetrical.

Philippinocoris is quite closely allied to *Stalocoris*, from which it may be separated by the greater degree of prolongation of the head in front of the eyes. In *Stalocoris* the head is produced beyond the eyes for only .11 the length of an eye while in *Philippinocoris* it extends anteriorly for .27 of the eye length. In addition the apices of the maxillary plates in *Stalocoris* do not exceed the base of the labrum as in *Philippinocoris*, due to the labrum being recessed less deeply beneath the anteclypeus, and the posterior margins of the propleurae lack a fringe of gold setae. *Stalocoris* species are also much smaller, averaging 6 mm. in length while specimens of *Philippinocoris*, at over 10 mm., are nearly twice as large.

As noted above, the three endemic genera of Philippine Naucoridae appear to be a closely related monophyletic group derived from the Naucorinae. One can trace a progressive modification of head structures from the primitive state in *Naucoris*, in which the labrum and rostrum arise essentially at the front of the head, to *Stalocoris*, in which both are slightly recessed, and on through *Philippinocoris* to *Asthenocoris*; in this latter taxon the labrum is recessed well under the anteclypeus and the rostrum has moved far back into a cavity on the underside of the head. The head structure in *Asthenocoris* is similar to that encountered in the Asian Cheirochelini and was considered evidence for a relationship between the Philippine and Indochinese taxa by Usinger (1938), but this resemblance is more likely the result of convergent evolution since the Cheirochelini have a distinctive symmetrical vesica and parameres quite unlike anything seen in the Philippine genera, as well as numerous

other synapomorphies distancing them from any Philippine or New Guinea species (D. Polhemus, in press). The endemic Philippine taxa are distinguished by the anterior projection of the prosternum, which angles forward over the base of the gula when viewed laterally (Fig. 2); this character state is not shared with the New Guinea taxa, in which the prosternal keel and gula meet evenly or show a weak projection of the gula posteriorly over the prosternum.

Although the naucorid faunas of the Philippines and New Guinea are allied, they appear to represent independent insular radiations from a common ancestral taxon near the present day *Naucoris*. Neither fauna shows an exceptionally strong relationship with either continental Asia or Australia. New Guinea is geologically younger than the Philippines but the degree of generic differentiation there has been far higher, producing seven endemic genera as compared to only three in the Philippines. This may be in part attributable to competition from other naucorid lineages in the latter region. *Aphelocheirus* has diversified extensively on Luzon but is represented by but a single species in New Guinea. In the southern Philippines laccocorine naucorids, the dominant subfamily on the Asian continent and through the Greater Sunda Islands, have managed to invade Mindanao via the Sulu Archipelago but occur no farther north than Leyte, and have not differentiated, being represented only by the abundant *Laccocoris hoogstraali*, a species closely related to taxa present in north Borneo; this subfamily does not occur on New Guinea.

Philippinocoris is known only from Luzon, which harbors an extremely rich and entirely endemic naucorid fauna; most of the distinctive Philippine elements appear to have arisen here and dispersed southward through the archipelago, but their influence is not felt beyond Mindanao. The large island of Celebes, lying between the Philippines and New Guinea, has a surprisingly impoverished naucorid fauna containing only the widespread genera *Naucoris* and *Aphelocheirus* despite an abundance of favorable habitats, a situation also pertaining in Australia. Why these two areas should not have developed radiative faunas similar to those found in the Philippines and New Guinea is puzzling and indicates that the latter two areas may have had a geological association predating the present juxtaposition of land masses in Wallacea.

***Philippinocoris usingeri* (La Rivers) New Combination**

Sagocoris usingeri La Rivers, 1970: 167.

The original description of the species by La Rivers (1970) is quite complete, but was based only on male specimens. We now have female examples, which are quite similar to the males in general structure and coloration. The subgenital plate is trapezoidal with a small, deep notch apically (Fig. 6), and the posterolateral angles of abdominal tergite VI are sharply downturned, usually to a greater degree on the left side when viewed from above. All specimens so far examined, of both sexes, have complete hemelytra but only partially developed hind wings and would appear to be incapable of flight. At present *P. usingeri* has been found only in the Cordillera Central of northern Luzon, where it inhabits cold, crashing, unpolluted rocky streams. The insects were found only in a few of the many streams sampled, but then in great numbers clinging to submerged vertical rock faces or root tangles along the margins of protected pools sheltered from the full force of the current, a habitat similar to that preferred by the related genus *Stalocoris*.

Material examined.—PHILIPPINES, Luzon, **Benguet Prov.**: 13 males, 20 females, 3 nymphs, rocky stream nr. km. 230 on Kennon Rd., 20 km. S. of Baguio City, 613 m. (2000 ft.), vii.8.85, CL 1966, J. T. and D. A. Polhemus (JTPC); 52 males, 33 females, 1 nymph, stream below Camp John Hay hydro plant, S. of Baguio City, 920 m. (3000 ft.), vii.8.85, CL 1968, J. T. and D. A. Polhemus (JTPC). **Mountain Prov.**: 2 males (holotype and paratype), Benguet, vii15.46, D. G. Frey (AMNH). **Ifugao Prov.**: 1 male, 1 immature, Jacmal Bunhian, 24 km. E. of Mayoyao, 800–1000 m. (2624–3280 ft.), iv.25.67, H. M. Torrevillas (BPBM).

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